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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/814,859

03/31/2004

Raghunath Vitthal Chaudhari

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08/31/2006

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EXAMINER

PUTTLITZ, KARL J

ART UNIT

PAPER NUMBER

1621

DATE MAILED: 08/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/814,859

Applicant(s)

CHAUDHARI ET AL.

Examiner

Karl J. Puttlitz

Art Unit

1621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-87 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-87 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-87 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Variable "R" in claim 1 is not defined.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al., **Bulletin of the Chemical Society of Japan, Vol.52** (1979) , No.9 pp.2735-2736 (Watanabe).

The rejected claims cover, inter alia, A process for preparing dioxy-functionalized propane compounds [see formula in claim 1]

which comprises:

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(a) contacting a vinyl carboxylate with carbon monoxide and hydrogen in a solvent in the presence of transition metal catalyst, to obtain an intermediate product mixture comprising of 3-carboxypropanal and 2-carboxypropanal;

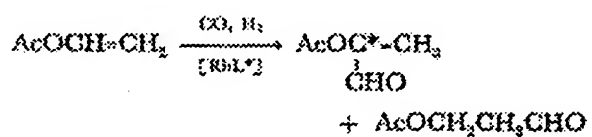
(b) adding water to the intermediate product mixture of 3-carboxypropanal and 2-carboxypropanal to extract the carboxypropanals into water to obtain an aqueous phase comprising of carboxypropanals and an organic phase comprising of transition metal catalyst and separating the aqueous phase from the organic phase;

(c) contacting the aqueous phase comprising of carboxypropanals with hydrogen in presence of a heterogeneous hydrogenation catalyst to obtain a hydrogenation product mixture comprising of 3-carboxypropanol and 2-carboxypropanol in aqueous phase and separating the hydrogenation catalyst from the aqueous phase;

(d) contacting the aqueous phase obtained in (c) comprising of carboxypropanols with a hydrolysis catalyst at a temperature within the range of 30 °C to 120°C. at least during a portion of a hydrolysis step to provide a product mixture comprising of 1,3- and 1,2-propanediol and a corresponding carboxylic acid;

(e) separating and recovering carboxylic acid, 1,3- and 1,2-propanediols from the aqueous mixture by distillative separation.

With regard to the above embodiments, Watanabe teaches the preparation of acetoxypromanal from vinyl acetate at page 2735:



Watanabe also teaches that tertiary phosphine–rhodium catalysts are useful for the above reaction. Watanabe also teaches that hydrogenation and hydrolysis of 2-acetoxypropanal with lithium aluminum hydride and 1 M HCl to produce optically active 1,2-propanediol. However, Watanabe could get only 2-acetoxypropanal with rhodium catalyst and the hydrogenation and hydrolysis is carried out with hazardous reagents. See page 2735.

Watanabe fails to explicitly teach the extracting and recycling requirements of the instant claims. However, these aspects of chemical synthesis are well within the motivation of those of ordinary skill for the purposes of optimizing the yield and efficiency of the process, and are thus, *prima facie* obvious.

Claims 23-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe in view of U.S. patent No. 5,530,150 to Takaya et al (Takaya).

The rejected claims cover those embodiments wherein a cobalt carbonyl catalyst includes a lipophilic ate promoter in an amount effective to promote the hydroformylation reaction to acetoxypropanals. It is for this proposition that the examiner joins Takaya, which teaches a hydroformylation reaction of vinyl acetate in reference example 1, see column 26. Cobalt can be used as the transition metal, see column 8. Specifically, additives such as fatty amines and pyridine compounds can be added to the hydroformylation reaction mixture, see column 12, lines 40-53. Those of ordinary skill would have been motivated to modify the disclosure of Watanabe to include the required cobalt catalyst and lipophilic amines since Takaya teaches that this

combination improves activity, positional and steric selectivity of the catalyst. Therefore the combination of Watanabe and Takaya renders the rejected claims *prima facie* obvious since these references teach or suggest the elements of the rejected claims with a reasonable expectation of success.

With regard to the required reaction parameters listed in the claims, these aspects of chemical synthesis are well within the motivation of those of ordinary skill for the purposes of optimizing the yield and efficiency of the process, and are thus, *prima facie* obvious. Moreover, the rearrangement of steps (claim 87, for example) are *prima facie* obvious since the reverse reactions taught by the references are within the motivation of those of ordinary skill to provide the desired propanals.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl J. Puttlitz whose telephone number is (571) 272-0645. The examiner can normally be reached on Monday to Friday from 9 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman K. Page, can be reached at telephone number (571) 272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Karl J. Puttlitz  
*Assistant Examiner*